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REPORT ON TAU INDIVIDUAL RESEARCH PROJECT 2015-2016

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Individual research project title: **Threshold concepts that represent troublesome knowledge to beginning Emergency Medical Science (EMS) Master's students at a University of Technology**

Abstract: This qualitative research project was undertaken to determine which threshold concepts (Meyer and Land, 2003, 2005; Cousin, 2014) EMS Master's students consider to be troublesome knowledge. The research tool employed was a qualitative questionnaire that was administered to six EMS Master's students at a South African University of Technology (UoT). Additionally, the researcher being an insider-researcher (Williams, 2009) was at once a participating observer with two of the Master's participants whom she supervised. Once these threshold concepts were identified, learning materials were developed to enable epistemological access: a glossary of research terms was developed, as well as notes on how to structure a proposal and a guide to writing a literature review.

The data revealed that students' agency was a two-headed beast that both enabled and constrained their master's studies. The data showed that the main threshold concepts that present entering Master's students with troublesome (and hence constraining) knowledge are:

Statistics, the research topic, methodology, research design, research question and setting research objectives/sub-questions for the main research question, and proposal development.

For some students the very question of agency itself was a threshold concept.

As can be seen these identified concepts are the *most fundamental* in the very beginning stages of magisterial research that simply *have* to be understood to enable epistemological access leading to progress in the research process. The conceptual framework and, therefore, the lens used to gaze upon these threshold concepts is that of Critical Realism, particularly the work of Dave Elder-Vass (2010) into structure and agency and the causal powers of emergence as well as Margaret Archer's work on culture. In this way both the epistemological and ontological aspects are covered.

1. Introduction

As a supervisor of both Master's and Doctoral students it strikes me that there are necessary, fundamental transformational processes comprising threshold concepts and troublesome knowledge that higher degree students have to work through before they are enabled to progress with their studies. Unless these thresholds of learning are crossed and the troublesome knowledge "managed", these students are not transformed nor empowered to move from a space of "becoming" magisterial students to actually undergoing a shift in identity that moves them into a space of "being" Master's students. However, using a critical realist lens to gaze upon the problem highlights certain aspects, namely structure and agency (not to be regarded as a binary constellation of "either-or", but "both-and") and causality of structures and emergence viewed through the work of the critical realist, Elder-Vass (2010) and Archer on culture and agency (1996). Although there is interplay between structure, culture and agency, they cannot be conflated, i.e. they cannot be collapsed into one another, because these are relatively autonomous aspects of social interaction and social life (Archer, 1996: *xiv*).

This research is important because transformation in SA higher education requires that more students undertake a Master's Degree which will then lead to them doing a Ph.D. In fact, the National Development Plan wants to have 5000 PhDs graduating per year by 2030 (Mouton in MacGregor, 2013). However, statistics from 2012 indicate that there is a low graduation rate in SA of 21% for Master's Degrees and 13% for doctorates (DHET, 2014). This implies that many higher degree students are either dropping out or taking much longer to completion (CHE, 2010). This ontological lack of "becoming" a Master's scholar or doctoral scholar may be one among many reasons why there is a low graduation rate in SA for Master's Degrees and doctorates (DHET, 2014). Thus, determining what troublesome knowledge is, i.e. threshold concepts, for beginning EMS Master's students, would allow supervisors to guide their students to deal with them. Developing teaching & learning materials to deal with these constraining threshold concepts could enable higher degree students to make the transition into their studies more easily, grow their own "Master" identity and stay the course to graduation within prescribed time.

2. Problem statement

I shall start off by making an assertion stemming from my Ph.D. research: "Higher degree learning is transformational both ontologically and epistemologically through a process of "becoming" that includes changes in identity and leads to "being". In other words, a postgraduate Master's student has first to undergo a process of becoming such a student before transformation of identity happens to being a Master's student and a scholarly researcher. However, from my personal observations of Master's and doctoral candidates (especially those who are at a UoT or have come from a UoT background), I have seen that sometimes this transformation does not occur nor is there a change in identity (i.e. the students do not "become" Master's students and never get to grips with their research, i.e. epistemological and ontological access has not been enabled). I have observed that beginning Master's students (particularly at a University of Technology) find it difficult to make the transition to doing the Master's. While research has been done into the transition into postgraduate studies (Huessi, 2012; James, 2012; Hoffman and Julie, 2012) and particularly from a threshold concept perspective (Wisker, Kiley and Aiston, 2006), little has been done specifically in the field of Emergency Medical Science in South Africa.

From my research into threshold concepts (Meyer & Land, 2003; Cousin, 2006, 2012; Higgs, 2012; Land, Rattray, Vivian, 2014.) and my supervision of Master's students, I concluded that there are specific threshold concepts (TC) linked to Master's studies such as the proposal, ethics, informed consent, research, critical academic reading that may impact upon the process of becoming a Master's student and other transition difficulties. Thus, my observations may serve as a kind of hypothesis, which my research would test with a qualitative rather than a quantitative questionnaire.

3. Research Question

What are the threshold concepts within initial Master's studies as perceived by EMS Master's students that hinder postgraduate epistemological and ontological access to higher degrees?

3.2 Research Sub-question:

1. What kind of learning/ thinking materials could be developed to address these EMS Master's threshold concepts?

3.3 Aims of this research:

The aims of this research are (a) to discover which threshold concepts EMS Master's students consider to be troublesome knowledge and (b) to try to develop learning/thinking materials to empower students to grasp these threshold concepts, and thus, to enable epistemological access to higher degrees for EMS Master's students in a South African UoT context.

4. Literature review

4.1 What are threshold concepts and troublesome knowledge?

Meyer and Land (2003) define threshold concepts as a kind of gateway, a liminal space, to transformative understanding through which a student must pass in order to achieve understanding and learning within a formulated curriculum. A threshold concept is seen as a "key" concept within a discipline or field that must be grasped to move the student to a deeper level of learning. Characteristics of a threshold concept are: integrative, transformative, irreversible, bounded, re-constitutive, discursive, and troublesome (Land, 2012). TCs are transformative in that once grasped they transform a student's understanding of the subject as well as changing the student from one who does not know to one who knows; thus they are transformative epistemologically as well as ontologically (Cousin, 2006). They are irreversible, because once the threshold of understanding is crossed, it is difficult to go back and "unknow" a concept. They are integrative because they reveal how inter-connected phenomena are. They are bounded, i.e. have limits. They also involve "troublesome knowledge" (Perkins in Meyer and Land, 2003) which may be strange or counter-intuitive to a student in challenging held beliefs or "common-sense" (Cousin, 2006). These concepts are generally regarded as obstacles and thus, usually associated with troublesome knowledge (Perkins 2006:43). Troublesome knowledge may be conceptually difficult with troublesome language and may include tacit knowledge as well. Troublesome knowledge hinders epistemological access.

4.2 Critical Realism as conceptual Framework

Critical realism is a philosophy developed by Roy Bhaskar (1978) that posits a stratified and depth ontology and views the world as an open system on which to overlay substantive theory (Bhaskar, 2012). Bhaskar proposes that reality consists of three strata/domains/levels, namely the Real, the Actual and the Empirical with the Real domain comprising generative mechanisms and causal powers.

One of the greatest changes that critical realism introduced was in the concept of causality. Bhaskar (2012) rejected empirical causality as the constant conjunction of events happening within a closed system. Instead, he presented a new concept of causality within an **open** system where reasons when acted upon can be causes; where structures have generative mechanisms, causal powers/liabilities (the powers and liabilities are like two sides of a coin) and tendencies operating in the domain of the Real, which may be exercised or not, manifested or not (Hartwig, 2007: 57).

4.3 What is meant by structure and agency in critical realism?

Khana, Qualtera and Young (2012) point out that Archer's account of the interplay of social structure and human agency attempts to account for agents' use of their personal powers to act in one particular manner, rather than another within a social context (Archer 2003: 3). The concept "social structure" may refer to social structures such as marriage, relationship, parenthood, family, society, the university as institution, and curriculum (Khana *et al.*, 2012). Culture may refer to values, beliefs,

belief-systems and ideas held by individuals and/or groups (Archer, 2003). Agency encompasses the personal emergent powers that may be exercised by individuals and groups or not. Elder-Vass (2010: 3) holds that specific people and specific groups have social structural power. He mentions that “some of these groups are entities with emergent causal powers, distinct from those of individuals”. Elder-Vass (2010:4) sees emergence as expressing the notion that an entity or whole can have properties or capabilities that are not possessed by its parts. Such properties are called emergent properties; these could be personal powers. Elder-Vass (*ibid.*) makes the point that “the word emergence does not refer to temporal emergence; instead it refers to what we might call synchronic emergence, which is a *relationship* between the properties of a whole and its parts at a particular moment in time”.

7. Research Design and theoretical framework

This is a qualitative research study taking the form of a case study (Easton, 2009). The conceptual framework is that of Critical Realism (Bhaskar, 1993).

7.1 Participant selection and research method

The participants were purposively chosen because the research focussed on the eight EMS Master’s students at a UoT. An anonymous qualitative questionnaire was sent to the eight participants. However, only six responded and completed the questionnaire and submitted it to the secretary of the EMS department so that she could give them to me without compromising the participants’ anonymity. I had intended to have follow-up personal Skype interviews with the participants, but none volunteered.

8. Research findings

It is clear from the data that structure impacts differently on each of the participants and constrains or enables their agency. The agency of master’s students is a two-headed beast. On the one hand most Master’s students are prepared and willing to exercise their agency in Master’s studies; however, on the other hand, many feel their agentic ability is compromised and impeded by structure i.e. their jobs, and personal or family commitments. Thus, there seems to be some difficulty dealing with the nexus of time to research and time required by their job, personal life and family time. They felt they would need to exercise their agency here to make research time i.e. to enable the emergence of their personal powers in terms of agency.

The Master’s students seem to have a troubled identity in the sense that on the one hand they see themselves as confident and taking pride in being Master’s students, but on the other hand many of the Master’s students feel stressed and anxious. This would indicate that their personal powers have emerged differently. While considering themselves as emerging scholars with feelings of being productive and confidence, they also find it difficult to actually establish their own identity as scholars because they do not realise and/or accept how much reading there is to do, and how much clear thinking and writing is required. Thus, there is a disconnect between their identity and their ontological access to Masters’ studies.

Epistemological access is only enabled in some beginning Master’s students and not others. The Emergency Medical Science Master’s students found epistemological access constrained by difficulty in choosing a topic and formulating the research question. This is another example of structure impacting differently on the students. They manifested this constraint on epistemological access in the identification of the following threshold concepts and troublesome knowledge: Statistics, Research Question, Setting objectives/sub-questions to the main research question, Proposal development (for some students) and depth of critical reading required.

In addition, the UoT participants thought there was a big gap between the B.Tech research project (their only experience of prior research) and coming into Master’s research. For these EMS students this is a particularly relevant and important point because the B.Tech programme and curriculum are structures that impact differently on the Master’s students.

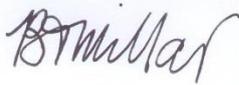
The student-supervisor relationship is an example of the interplay between structure, culture and agency as indicated by the participants. The emergent personal powers of each student indicates a particular relationship between structure, culture and agency in terms of the student-supervisor relationship. Some students requested a more directive approach to be taken by the supervisor, while other requested a more dialogic interaction.

In terms of structure, culture and agency, it appears from the data that structure (i.e. the job or family) impacts greatly (but also differently) upon the participants of this study. The data also reveals that there is a disconnect between the participants' view of their agentic abilities as well as their knowledge and the supervisor's view of their agentic abilities and knowledge. In many cases the Master's students are overly self-confident about these, only to be disconcerted by the reality of Master's studies which requires them to engage in critical reading and a heavily iterative process of rewriting.

9. Conclusion

Structure, culture and agency impact differently upon EMS Master's students because each one brings her/his own subjective experiences and objective situation into the Master's programme. The emergence of personal powers occurs variously in the participants. This leads to some students being more enabled to make the transition into postgraduate studies than others. The relationship between structure, culture and agency that each student experiences, seems to impact upon which threshold concepts become troublesome knowledge to the EMS Master's students.

Engaging in postgraduate research as a process leading to epistemological and ontological transformation requires an understanding, appreciation and acceptance of the time such a process requires. Engaging with the threshold concepts leads to epistemological and ontological transformation and transition into *becoming* and then *being* a Master's student. This is an area that would lend itself to further research, not only in terms of the Emergency Science Students at a University of Technology, but students of other UoT disciplines as well.



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